UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Eugene District Office
P.O. Box 10226
Eugene, Oregon 97440-2226

IN REPLY REFER TO:
1792A
McKenzie Tribs
EA-08-01

November 13, 2007

Concerned Citizen,

The Upper Willamette Resource Area of the Eugene District Bureau of Land Management has completed the Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the proposed McKenzie Tribs Project located in Sections 25, 33 and 35 T. 16 S., R. 1 E., W.M.

You have expressed an interest in receiving copies of Environmental Assessments for district projects. Enclosed is a copy of the EA for your review and any comments. Public notice of this proposed action will be published in the Eugene Register Guard on November 14, 2007. The EA will be available on the internet at http://www.blm.gov/or/districts/eugene/plans/index.php. The public comment period will end on December 14, 2007. Please submit comments to me at the district office, by mail, or by e-mail at or_eugene_mail@blm.gov by close of business (4:15 p.m.) on or prior to December 14, 2007. If you have any questions concerning this proposal, feel free to call Christie Hardenbrook at 541-683-6110.

Comments, including names and street addresses of respondents, will be available for public review at the district office, 2890 Chad Drive, Eugene, Oregon during regular business hours (7:45 a.m. to 4:15 p.m.), Monday through Friday, except holidays, and may be published as part of the EA or other related documents. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses and from individuals identifying themselves as representatives or officials of organizations or businesses will be made available for public inspection in their entirety.

Sincerely,

William O'Sullivan, Field Manager
Upper Willamette Resource Area

Enclosure

MCKENZIE TRIBS

UPPER WILLAMETTE RESOURCE AREA
BLM EUGENE DISTRICT
ENVIRONMENTAL ASSESSMENT
OR090-EA-08-01

1.0 PURPOSE AND NEED FOR ACTION

The Upper Willamette Resource Area of the Eugene District BLM proposes to initiate forest management activities on approximately 1000 acres located in Sections 25, 33 and 35, T. 16 S., R. 1 E., W.M. Stand ages range from 45-65 years old. These activities may include timber harvest and road management activities (improvement, construction, and decommissioning). The land use allocations for these sections are Matrix, Central Cascades Adaptive Management Area (CCAMA), Riparian Reserve (RR), and Bald Eagle Habitat Area (BEHA).

The purpose of the action in Matrix is to provide a sustainable supply of timber while maintaining valuable structural components (e.g., snags and down wood) and to provide habitat for a variety of organisms associated with both late-successional and younger forests. Specific objectives of the proposed thinning are to: (1) increase the proportion of merchantable volume in the stand, (2) produce larger more valuable logs, (3) accelerate the development of trees that can later provide large-diameter snags and down logs, (4) manage species composition, and (5) promote development of desired understory vegetation (RMP, p. 200). The need for action in the Matrix is established in the *Eugene District Record of Decision and Resource Management Plan* (RMP), which directs that timber be harvested from Matrix lands to provide a sustainable supply of timber (RMP, p. 34). The need is also established from stand examinations that indicate that some of the stands would benefit from thinning.

Additional direction from the RMP directs that the CCAMA contribute substantially to the provision of a stable timber supply (RMP, p. 32). Stands in the CCAMA would be thinned according to recommendations outlined in a BLM developed landscape design called the Middle McKenzie Landscape Design (MMLD), which uses a management strategy to achieve ecological and social objectives based upon historical fire disturbance regimes. Generally the MMLD recommends that stands be thinned to increase wind-firmness and to develop crowns on future retention trees. The need to thin in the CCAMA is based on stand exams that show the stands are at a high density, which is decreasing vigor and growth of the trees.

The purpose for action in Riparian Reserves is to enhance or maintain late-successional forest conditions, acquire or maintain characteristics needed to attain Aquatic Conservation Strategy objectives, and provide habitat for Special Status Species, SEIS special attention, and other terrestrial species (RMP, pp.18, 23). Specific objectives are to: (1) manage Riparian Reserves to control stocking and species composition; (2) reduce road related sediment sources to stream habitat by replacing/adding culverts and maintaining or upgrading road infrastructure; and (3) enhance terrestrial and aquatic habitat conditions by creating snags and down wood. The need for the action in Riparian Reserve is established by stand examinations, which show that portions of the Riparian Reserves are overstocked and deficient in late-successional structural components.

The purpose for action in the BEHA, is to comply with the Recovery Plan for the Pacific Bald Eagle and existing, site-specific habitat management plans, such as *the McKenzie Bald Eagle Management Plan* (RMP, p. 62). Management objectives are to: (1) maintain or enhance individual large trees with late seral characteristics (e.g., large side limbs, large crowns) for nesting; (2) maintain or enhance stands with mature to late seral characteristics for nesting and/or midwinter roosting; (3) minimize human access and visual and line-of-sight noise disturbances that could affect nesting behavior. The need for action is established by stand examinations that show the stands within the BEHA are uniform in structure and lacking habitat elements for Bald Eagles.

1.1 CONFORMANCE

This environmental assessment (EA) is consistent with the *Record of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management Planning Documents*

Within the Range of the Northern Spotted Owl (April 1994) and *the Eugene District Record of Decision and Resource Management Plan (June 1995*), Aquatic Conservation Strategy (ACS) Objectives listed on page B-11 of the *Northwest Forest Plan,* and the Record of Decision for *Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (2001) The McKenzie Tribs project file contains additional information compiled by the Interdisciplinary Team (ID Team) to analyze effects and is available for review at the Eugene District Office.

1.2 ISSUES

The ID Team identified the following issue for analysis in this document.

- What would be the disturbance and habitat modification effects to the Northern Spotted Owl (NSO) due to harvesting activities?

1.3 ACS CONSISTENCY

This section summarizes how the no action and action alternatives retard, maintain or enhance the attainment of ACS objectives, as outlined in 1994 NWFP ROD on page B-11.

Alternative 1- No Action:

- ***Objective #1****: Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.*

  Under this alternative, stream and riparian ecological conditions would be maintained. Small and large wood recruitment to the stream and riparian would continue over time. The development of future large wood debris, structural and species diversity would occur but at a slower rate due to the uniform, overstocked stand condition in riparian reserves.

- ***Objective #2****: Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include flood plains, wetlands, up slope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.*

  Stream and wetland network connections would be maintained in the short term. Riparian, off-channel habitat, refugia, and floodplain connectivity would not be affected. Some stream crossing culverts are undersized, deteriorating, or otherwise at risk of failure in the next decade and drainage network connections could be blocked by fill failures, retarding compliance with ACS Objective 2 in the long term.

- ***Objective #3:*** *Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.*

  The physical integrity of the aquatic system would be maintained in the short term. No stream crossings or relief culverts would be replaced, removed, or added. As a result, fill or stream crossing failures could retard the attainment of ACS Objective 3 in the long term.

- ***Objective #4:*** *Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.*

  In the short-term, water quality would be maintained. In the long-term, sedimentation could increase and negatively impact water quality and downstream spawning habitat for fish as existing stream crossings, relief drainage, and general road conditions deteriorate from lack of repair and maintenance. Existing shade would remain along streams; therefore, water temperature would be maintained in the short and long term. No impacts to other water

quality parameters such as pH, conductivity, dissolved oxygen, and nutrients would be anticipated.

- ***Objective #5:*** *Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.*

  There would be no increase in the road density network and connectivity to the stream network. The sediment regime would be maintained in the short-term. There would be no increase in road use from haul, no direct sediment pulses from removing and replacing stream crossing culverts, installing temporary culverts, or renovating roads. The road segments that currently deliver sediment would continue to deliver at the existing rate, which is dependent on future use from other activities that occur in the watershed.

  In the long-term, the risk of culvert failure and chronic sedimentation to fish-bearing habitat would be higher under this alternative. Old and undersized culverts would not be upgraded. There would be no benefits in reducing sediment delivery from adding cross drains or decommissioning roads because those actions would not occur.

- ***Objective #6:*** *Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.*

  In-stream flows and patterns of sediment routing would be maintained. Existing conditions that affect summer low flows, overall water yield, and peak flow would remain on the current trajectory. There would be no alteration in the factors that influence evapotranspiration and interception.

- ***Objective #7:*** *Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.*

  The existing vegetative cover in the project area would be retained, and no road construction or harvest would occur near floodplains, meadows or wetlands. Therefore, this alternative would maintain the timing, variability and duration of floodplain inundation. Water table elevation would be maintained in meadows and wetlands.

- ***Objective #8:*** *Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distribution of coarse woody debris sufficient to sustain physical complexity and stability.*

  Current rates of surface erosion, bank erosion, and channel migration would continue in the short-term. In the long-term, stream crossing failure could result in channel migration and a degraded condition from associated bank erosion.

  Existing species composition would be maintained in and near riparian areas. Untreated Riparian Reserves would continue to recruit coarse woody debris mostly through density-induced mortality for several decades but would not realize the accelerated eventual benefits of disease-induced mortality recruitment from larger trees.

- **Objective #9:** *Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.*

  Vertebrate riparian-dependent species would be maintained and unaffected by the No Action Alternative with the exception that the long term benefits of thinning described under ACS Objective 8 would not be realized in the future.

Alternatives 2 and 3:

- ***Objective #1****: Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.*

  In Alternative 2, thinning in the riparian reserves would likely contribute to the distribution, diversity and complexity of this landscape feature. Thinning in the riparian reserves is intended to speed the development of late-successional characteristics, such as structural complexity, larger diameter conifer trees, and a future source of instream large woody debris. No-harvest buffers would protect critical shade vegetation to the stream, reduce sediment transport to streams, and maintain a source of small and large woody debris input.

- ***Objective #2:*** *Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include flood plains, wetlands, up slope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.*

  Drainage network connections would be enhanced by installing properly sized and functioning culverts at road stream crossings. The decommissioning of roads and the removal of road-stream crossings would help restore the spatial and temporal connectivity for aquatic and riparian-dependent species. No new roads would be constructed in riparian reserves that could degrade connectivity for aquatic species.

- ***Objective #3:*** *Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.*

  Replacing rusted or damaged stream crossing culverts would reduce the risk of fill failures. Permanent culverts would be sized to accommodate 100 year storm events, reducing the risk of failure in major flood events. Removing and replacing stream crossing culverts, and adding temporary stream crossings, would produce a temporary pulse of sediment (see ACS Objective 5) but would unlikely affect the physical integrity of the stream channels. There would be a long-term reduction in the risk of fill failures at those sites. Additional cross drains would also reduce the risk of chronic catastrophic crossing failures, road related landslides, and direct sediment delivery to streams. The risk of failure would be eliminated at sites where existing culverts would be removed via road decommissioning. Untreated stream buffers ranging between 75 to 200 feet on either side of stream channels would protect the integrity of stream banks and channels.

- ***Objective #4:*** *Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.*

  Short-term sedimentation from stream crossing work would result in long-term improvements to water quality. The addition of relief drainage and road surfacing aggregate would reduce road related sediment production in the long-term and have no direct impact on existing water quality. Some local erosion is likely to occur from yarding operations; however, sediment transport to streams is expected to be minor because the sediment would be trapped within the no-harvest buffers before it reaches the stream.

  Water temperature would be maintained because the primary shade zone adjacent to all streams would be left intact. No impacts to other water quality parameters such as pH, conductivity, dissolved oxygen, and nutrients would be anticipated. Habitat features essential to fish and aquatic resources would be maintained.

- ***Objective #5:*** *Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.*

Short-term sediment increases from activities associated with removing and replacing stream crossing culverts, adding temporary culverts, installing cross drains, road renovation, construction or decommissioning would have a minor effect on total sediment delivery to streams due to mitigation measures, quantities, and proximity to streams.

Long-term sediment reduction would correlate to the number of road miles upgraded and number of road-stream crossings removed during the project. Upgrades and reduction of road density stream crossings to the existing transportation system would result in less sediment production within the watershed.

- ***Objective #6:*** *Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.*

  These harvest areas are at elevations where predominately rain events occur. Commercial thinning operations and road work are not expected to impact the timing and magnitude of peak flows.

- ***Objective #7:*** *Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.*

  Protective buffers adjacent to all streams, springs, and wetlands would protect surface and subsurface hydrology. Improved road drainage measures would minimize road related runoff to nearby streams and wetlands so that floodplain inundation and groundwater levels would be protected.

- **Objective #8:** *Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distribution of coarse woody debris sufficient to sustain physical complexity and stability.*

  No timber harvest would occur within 75 to 200 feet of the streams (depending on the stream), so streamside bank erosion, surface erosion and channel migration would not be impacted by harvesting activities. Road construction, renovation, and decommissioning would be conducted to protect stream channels from chronic sediment inputs.

  Two Special Status riparian dependent species, cascade torrent salamander and harlequin duck, are analyzed in this EA (see Section 3.3.2). Both aquatic and associated riparian terrestrial habitats for these species would be maintained by project actions without long term adverse effects. The only short term impact could be to the quality or function of down logs due to changes in surrounding stand microclimates. These effects would be short term (10-15 years) until canopy conditions recover from thinning.

  Portions of Riparian Reserves not thinned would continue to recruit coarse woody debris through density-induced mortality for several decades. In portions of Riparian Reserves thinned, density-induced mortality of coarse woody debris recruitment would be greatly reduced. However, thinning would accelerate growth rates of dominant trees and provide large coarse woody debris recruitment mostly by windthrow, breakage, and disease-induced mortality, etc.) sooner than areas not treated by thinning.

  Some riparian associated (e.g., spotted owls) and riparian dependent species (e.g.,fringed myotis bat) would experience a short 10-15 year reduction in terrestrial habitat until conditions recover and overall long term benefits of accelerated tree growth are realized. These short term effects would not be adverse in their intensity or duration.

Overall, thinning in Riparian Reserves would benefit most riparian dependent or associated species by accelerating the rate stands would achieve late-seral characteristics such as large trees and complex canopy layers.

- **Objective #9:** *Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.*

  Two Special Status riparian dependent species are analyzed in this EA - cascade torrent salamander and harlequin duck. Effects to these species are discussed in Section 3.3.2. Both aquatic and associated riparian terrestrial habitats for these species would be maintained by project actions. Water quality for riparian dependent aquatic species such as salamanders and invertebrates would be maintained or enhanced. Thinned portions of Riparian Reserves would be enhanced as described under ACS Objective #8.

2.0 ALTERNATIVES

This section describes alternatives identified by the interdisciplinary team. Please refer to Appendix A for maps of the project proposal.

2.1 Alternative 1: No Action

Under this alternative no actions would take place. No thinning, road management or habitat restoration actions would occur within the proposed project area. The purpose and need of the project proposal would not be met.

2.2 Alternative 2: Thinning and BEHA treatment with Required Minimum Buffer for NSO.

This alternative proposed to treat all candidate acres outside of a required minimum buffer of 200 meters for Northern Spotted Owls.

Upland Thinning

- This alternative consists of three commercial thinning areas (T. 16 S., R 1 E., Sections 25, 33 and 35) of approximately 827 acres. Thinning would be designed to increase tree size through time, develop windfirm trees, extend the culmination of mean annual increment and capture anticipated mortality. The stands would be thinned from below. Trees selected for harvest would be the suppressed, intermediate, and co-dominant conifer trees, leaving the larger trees. Cut trees would be Douglas-fir and western hemlock. This prescription would result in a stand with variable spacing, of 15 and 35 feet between the Douglas-fir and hemlock. Incense cedar, western red-cedar, Pacific yew, and hardwood trees would be retained, except where necessary to accommodate logging systems and for safety. There would be unthinned patches around rock outcrops, shallow soils, wet areas and unthinned riparian zones. Leaving the Hardwoods, western red cedar, incense cedar and Pacific yew trees would provide species diversity, structural diversity as well as variable density throughout.

- *Johnson Creek Section 33 (284 acres):* thinning would reduce the number of trees from approximately 150 trees per acre (TPA) to approximately 85 TPA, with an average spacing of 25 feet.

- *Cogswell Creek BEHA Section 35 (292 acres):* thinning would reduce the number of trees from approximately 150-180 TPA to approximately 50-80 TPA, with an average spacing of 25-30 feet. This section is designated as Bald Eagle Habitat Area.

- *Hatchery Creek BEHA Section 25 (164 acres):* thinning would reduce the number of trees from approximately 70 TPA to approximately 40 TPA, with an average spacing of 30 feet. The southwest portion in this section is designated as Bald Eagle Habitat Area.

- *Hatchery Creek Adaptive Management Area Section 25 (87 acres):* thinning would reduce the number of trees from approximately 160 TPA to approximately 80 TPA, with an average spacing of 25 feet.

BEHA Target Tree Release

In addition to the commercial thinning throughout the BEHA stands, this proposal would also designate approximately 150 target trees; all trees within a 50 foot radius (0.18 acre) of that target tree would be removed. Target tree treatment would occur on approximately 440 acres. This treatment is designed to accelerate the development of suitable nest trees. The final arrangement of selected trees will be randomly spaced with occasional clumping. The single trees selected to become "target trees" would be a mix of co-dominant and dominant Douglas-fir trees, which have crown ratios of at least 30% and structural characteristics that make them more likely to benefit from release (e.g., large bole and crowns, deformities). These gaps would cover approximately 6% of the treated area. Target trees would be selected in areas that are less prone to wind events and located in areas that would have the highest potential for eagle use based primarily on line-of-sight views to the McKenzie River.

Riparian Reserve management

Silvicultural treatments would occur in the outer edges of the riparian zone and would be treated the same as upland. No-harvest buffers adjacent to streams would vary between 75 and 200 feet. Seeps and springs would have a no-harvest buffer ranging between 25 to 50 feet. The buffers for wetlands would vary from the hydric soil boundary to 220 feet.

Logging Systems

All harvest would be accomplished with a combination of helicopter, cable and ground-based yarding systems. Helicopter yarding is proposed for approximately 122 acres, cable yarding would be proposed for an estimated 528 acres and ground-based yarding would be proposed for approximately 101 acres (see maps in Appendix A).

Roads

Improvement and Construction:

The transportation of timber would occur over approximately 25 miles of gravel road of mixed BLM and private road control. Roughly 13.5 miles of existing BLM roads would be utilized as part of this project. Of that total, an estimated 11 miles of road would need maintenance, including approximately 11 miles of additional crushed rock surfacing (Table 2). There would be about 1 mile of proposed temporary road construction with three stream crossings, and approximately 1.5 miles of permanent road construction with crushed rock and no stream crossings.

Culvert Replacement:

There would be approximately 12 stream culverts and 29 ditch relief culverts replaced.

Road Decommissioning:

Approximately 2.4 miles of proposed and existing roads would be fully decommissioned at the conclusion of the project. This would consist of blocking access, removal of the culverts and the tilling of roadbeds where subgrade conditions allow. Less than ¼ mile of proposed roads would be partially decommissioned at the conclusion of the project. This would consist of construction waterbars and blocking vehicle access.

2.3 Alternative 3: Thinning and BEHA treatment with a Larger Buffer for NSO

This alternative proposes to leave more buffer acres for the Northern Spotted Owl. Harvest activities would occur on 743 acres as opposed to the 827 acres proposed for treatment in Alternative 2. All other elements remain the same as Alternative 2.

Logging Systems

All harvest would be accomplished with a combination of helicopter, cable and ground-based yarding systems. Helicopter yarding is proposed for approximately 114 acres, cable yarding

would be proposed for approximately 528 acres and ground-based yarding would be proposed for approximately 101 acres (see maps in Appendix A).

Table 1: Road Decommissioning

Road	Length Miles	Road Post-Sale Action
16-1E-25.1	0.32	Block and Till
16-1E-25.10	0.34	Block and Till
16-1E-25.11	0.25	Block and Till
16-1E-25.12	0.06	Block and Till
Landing Spur (Sec. 25)	0.05	Block and Till
16-1E-35.2	0.60	Block and Till
16-1E-35.3	0.23	Block
Quad Trail by Cogswell Ck	0.05	Block and Till
Spur A (Sec. 25)	0.04	Block and Till
Spur E (Sec. 35)	0.11	Block
Spur F (Sec. 35)	0.17	Block
Spur C (Sec. 35)	0.10	Block and Till
Spur D (Sec. 35)	0.08	Block and Till
Total≈	***2.40***	

Table 2: Proposed Road Improvements and Construction

Temporary Road Construction		**Length (ft.)**	**Surface**
Spur 25A		200	Native surface
Spur 35C		900	Native surface
Spur 35D		500	Native surface
Total≈		***1600***	
Maintenance by Road Number	**Action**	**Length (ft.)**	**Recommended Surfacing**
16-1E-25.1	Spot rock surfacing	1610	Various thickness
16-1E-25.2	Spot rock surfacing	1907	Various thickness
16-1E-25.3	Spot rock surfacing	3242	Various thickness
16-1E-25.4	Spot rock surfacing; replace 1 culvert	3310	Various thickness
16-1E-25.7	Spot rock surfacing; replace 1 culvert	5987	Various thickness
16-1E-25.8	Spot rock surfacing	2238	Various thickness
16-1E-25.9	Spot rock surfacing	1911	Various thickness
16-1E-35.10	Spot rock surfacing	1758	Various thickness
16-1E-35.2	Renovation	3800	Native surface
16-1E-25.11	Spot rock surfacing	1235	Various thickness
16-1-35.0	Lift of rock	2070	4”
16-1E-35.1	Lift of rock; replacing 3 culverts	4393	4”
17-1E-1	Lift of rock; replacing 7 culverts	14425	6”
17-1E-4	Renovation	4000	Rock
Total		***51,886 (≅9.83 miles)***	
Permanent Road Construction		**Length (ft.)**	**Surfacing**
16-1-26.1		1400	Rock
16-1-34.3A		600	Rock
16-1-34.3B		500	Rock
Spur 35E		600	Rock
Spur 35F		900	Rock
Total		***4000 (≅.75 miles)***	
Culvert Replacements		**Stream Crossings**	**Ditch Relief**
Total		***12***	***29***

2.4 Project Design Features

Harvest

1. Retain all western red-cedar, Pacific yew, and hardwood trees, except where necessary to accommodate safety and logging systems.
2. Consistent with IM No. OR-99-036 ("E-4 Special Provisions"), apply seasonal restrictions or suspension of all harvest and road activities that would occur within 1/4 mile of: known nesting peregrine falcons, bald eagles, spotted owls, great grey owls, accipiter hawks, and other owls, hawks, or raptors if they are located at any time during project activities
3. For spotted owls: Consistent with consultation with the USFWS, apply Reasonable and Prudent Measures to minimize disturbance to spotted owl pairs and their progeny including:
    - For every year project actions occur, apply seasonal operating restrictions on helicopter, felling, yarding, hauling and road actions (construction, renovation, decommission, and culvert work) in and near:
        - Harvest areas 25A, 25B, and 25C from March 1 to July 15
        - Harvest areas Sec. 33 (all) and 35B and 35B1 from March 1 to August 30. (A detailed map of restricted areas can be found in the implementation file)
    - Actions along two roads have different restriction periods than the general restriction periods stated above. These are described below:
        - Road actions, including construction, renovation, decommissioning, and culvert installations, are restricted for Road No. 17-1E-4: from March 1 – August 31 and for Spur F from March 1 to July 15 (not all types of actions are currently proposed for each road)

    Any of the above restrictions may be waived or extended by the Area wildlife biologist based on relevant survey information regarding occupation or nesting activity. The BLM has no current plans to survey the area. If operators wish to survey the area and potentially modify these restrictions, arrangements must be made with the BLM to ensure surveys adequately address these restrictions.
4. Snags and down logs $\geq$ 16 inch diameter (decay classes 3, 4 and 5) and larger trees ($\geq$ 28 inch dbh) shall be retained undamaged when possible and would not be cut, except those in temporary road construction right of ways, landings, and yarding corridors, and those posing a safety hazard. Where possible, cable corridors shall be placed to avoid disturbance/degradation to snags and down logs $\geq$ 30 inch diameter.
5. Log lengths would be limited to 40 feet in length where necessary to minimize damage to residual trees, snags and coarse woody debris during yarding.
6. When operationally feasible, falling and yarding techniques would be utilized for the protection of retention trees, existing coarse woody debris, snags, and reserve areas.
7. Require one-end suspension of logs while skidding and cable yarding. Intermediate supports may be required to accomplish this objective.
8. Treat cable corridors with the potential for accelerated erosion with logging slash and/or waterbars as needed.
9. Ground-based yarding operations would occur where designated (see Appendix A for map). The following requirements would be applied to ground base yarding areas:
    - Require felling of trees to lead of the skid trails and maximize winching distances.
    - Placement of skid trails would be avoided within 150 feet of streams.
    - All skidding equipment would remain on the designated skid trails.
    - Average distance between skid trails would be 150 feet or greater where feasible.
    - Use existing skid trails, where possible.
    - Avoid placing skid trails on rocky soils.
    - Preplan and designate skid trails to occupy less than 10% of the Harvest Area.
    - Restrict yarding to seasonally dry period when soil moisture content provides the most resistance to compaction. This is usually July 1st through October 15th.
    - Till, where feasible, compacted skid trails, with an excavator to a depth of 18 inches, when soil moisture is appropriate. Minimize damage to residual tree roots adjacent to trails. To reduce erosion and restore soil productivity, pull slash, logging debris and brush from the adjacent forest floor onto the skid trails.

- If tillage cannot be accomplished the same operating season, all skid trails and temporary native surface roads would be left in an erosion resistant condition and blocked prior to the onset of wet weather. This would include construction of drainage dips, water bars, lead off ditches, and barriers (rootwads or brush piles) to prevent vehicle access until final blockage and/or tilling.

10. A cut-to-length harvester system may be approved when:
    - Capable of directionally falling trees
    - Traveling on the cushion of slash created by the harvesting process
    - Where slopes are less than 40%
    - Soil moistures are low (typically July 1 – Oct 15)
11. Helicopter yarding
    - Yarding would be done with a helicopter capable of suspending logs free and clear of the ground and treetops.
    - All helicopter landings would have prior approval to construct and or use.
    - Helicopter landings would be located outside of Riparian Reserves and not have direct connection (via road ditchline) to nearby streams.
12. To facilitate landings along Road No. 17-1E-1, short spurs or punch-outs (rock or native surface) may be constructed outside of the no-harvest riparian buffers. Where feasible, to minimize impacts to nearby streams, spurs or punch-outs within riparian reserves would be decommissioned (tilled, seeded, mulched, and tree planted) after use. The number of landings located on the road, rather than spurs or punch-outs, would be kept to a minimum within riparian reserves and would have no potential for direct or indirect sediment delivery to nearby streams. Sediment control measures would be implemented if necessary. Disturbed areas would be rehabilitated and left in an erosion resistant condition
13. <u>Bald Eagle Target Trees</u>:
    - Except where intentionally clumped to achieve BEHA objectives (2-5 trees in a clump), target trees will be spaced at least 100 feet apart.
    - To the degree possible, trees will preferentially be selected within areas that have the highest line-of-sight visibility to the McKenzie River.
    - No trees would be placed within 50 feet of “no-harvest” stream buffers nor within approximately 150 feet of unit edges that might be susceptible to windthrow.

<u>Road-Stream Crossing Replacements</u>

14. Perennial stream crossings would require the following:
    - Sediment containment structures would be placed across the channel below the work section (i.e. straw bales).
    - Stream flow would be routed around construction activity as much as possible (e.g. temporary flow diversion structure).
    - Work site would be pumped free of standing water. Disturbed sections would be planted with native seed and mulched with native straw or wood mulch or stabilized with rip-rap rock.

<u>Road Decommissioning</u>

15. Remove existing stream crossings and remove culverts.
16. On perennial streams sediment containment structure would be placed across the channel below the work section (i.e. straw bales).
17. Fill or waste material would be positioned in a location that would avoid direct or indirect sediment discharges to streams or wetlands.
18. Stream banks at removed road crossings would have the slope pulled back to an angle of natural repose.
19. Depending on site conditions, road drainage features (drain dips or waterbars) may be constructed on either side of restored stream channels to reduce road sediment delivery.
20. Restored stream banks would be vegetated with native plants, mulched with native straw or wood mulch, and planted with western red cedar where appropriate.
21. Where road subgrade conditions warrant, compacted road surfaces would be tilled with an excavator when soil moisture is appropriate (generally between July 1 and October 15). If tillage is not possible, then waterbars and lead-off ditches would be constructed to

reduce sedimentation to streams and wetlands. To the extent possible, logging debris and brush would be placed along the roadbed to reduce erosion and block access.

22. Earthen barricades with brush and slash additions would be constructed to block vehicle access.

Winter Log Haul Operations/Road Maintenance Activities

23. During heavy and/or prolonged rainfall or freezing and thawing periods, a combination of the following methods may be implemented to minimize sedimentation from the gravel surfaced roads reaching stream channels.
    - Keep the road crowned to direct the water off the running surface into the ditch line.
    - Keep the ditch line, cross drains, and leadoff ditches clean and free to flow.
    - Maintain well vegetated ditchlines. Sediment traps (i.e. straw bales, rock armor, or industrial shredded wood) may be installed in ditchlines lacking vegetation and having the potential to deliver sediment to streams.
    - Prior to and during haul operations, rock surfacing and road maintenance would be assessed throughout the project area and haul route.
    - If erosion and road degradation occur after freeze and thaw periods, log haul operations may be discontinued until appropriate repairs are made.

Native surface roads

24. Use of native surface roads shall be limited to the dry season (generally between July 1 and October 15). Waterbars, drain dips, and/or lead-off ditches may be required to create an erosion-resistant condition on roads during seasonal closures. Access to such roads shall be blocked during closures.
25. Area 35D and E would be restricted to a single season use where as Area 35A and C would be restricted to two season use. Stream crossing removals and road decommissioning would occur prior to October 15 of the same season of timber harvest.

Fuels Treatment

26. Landing piles along permanent roads would be covered and burned as directed by an authorized officer.
27. Slash, less than 6” in diameter and greater than 3 feet in length, within 25 feet of either side of the permanent roads within harvest areas would be piled, covered and burned.
28. Landing piles along temporary roads would be scattered on top of the road surface to remove the fuel concentrations and slow erosion. Resulting fuel bed should not be deep and continuous. Piles along temporary roads not scattered on the road surface would be covered and burned.

For All Activities:

29. In order to prevent the spread of noxious weeds from other locations, the Purchaser shall be required to clean logging, road construction, and tilling equipment prior to entry on BLM lands. The purpose of the cleaning is to remove dirt and plant debris that may contain noxious weed seeds from the undercarriage, tracks and tire treads of the equipment

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

3.1 VEGETATION

3.1.1 AFFECTED ENVIRONMENT

The forests in the project are 45-65 year-old stands that regenerated naturally after clearcut harvest, and salvage logging following large human caused fires. The stands consist primarily of Douglas-fir, with scattered western hemlock, western red cedar, bigleaf maple, Pacific yew, madrone, chinquapin and red alder. Stand understories consist of salal, bigleaf maple, vine maple, cascara buckthorn, and oceanspray. Current conifer stand density is approximately 70-185 trees per acre. The stands are currently in a stem exclusion phase, and the high overstory density is suppressing the growth of smaller trees and understory vegetation. Stand conditions in the outer portion of the Riparian Reserves are largely similar to the uplands. The immediate riparian zone of many of the streams in the project area are

dominated by deciduous trees, mostly red alder, bigleaf maple and scattered cottonwood trees.

Botanical surveys for BLM Special Status Species were completed during the months of May and June 2007. Most populations fall outside of proposed project boundaries. The Special Status species that were found did not require protection (see Table 3).

Table 3: Special Status Species

	Cogswell Creek	Hatchery Creek	Johnson Creek
Bureau status	**Species located**	**Species located**	**Species located**
Bureau Assessment		*Pseudocyphellaria mallota*	
Bureau Tracking	*Chaenotheca furfuracea*	*Chaenotheca furfuracea*	
Bureau Tracking	*Platyhypnidium riparioides*		*Platyhypnidium riparioides*
Bureau Tracking	*Usnea longissima*	*Usnea longissima*	
"taxonomic review"		*Sticta "weigelii"*	

3.1.2 ENVIRONMENTAL CONSEQUENCES

Alternative 1: No Action

Under the no action alternative, the project area would remain untreated until the stand reaches minimum age for final harvest. These stands would continue to experience mortality, suppression, and reduced growth from tree to tree competition. Anticipated mortality would not be captured and future harvest volumes would be reduced. The stagnant forest conditions develop a dense closed canopy that reduces the understory vegetative growth and species diversity.

In the BEHA treatment area the stand would continue to grow at a slower pace with no final harvest planned. Suitable nesting trees would also develop at a slower pace.

Alternative 2: Thinning and BEHA Treatment with a Required Minimum Buffer for NSO

The proposed thinning would reduce stand density, decrease tree to tree competition and accelerate tree growth resulting in larger trees over time. The reduction in density would also increase species diversity by allowing increased sunlight to penetrate to the forest floor. Target tree treatment in the BEHA would create gaps, which would improve tree architecture by allowing sunlight to penetrate through the canopy allowing the target tree to develop epicormic branching and increased lateral branching.

In addition, silvicultural treatments would enhance important structural features that are likely to promote the majority of epiphytic macrolichens by reintroducing structural diversity into an otherwise monotonous young stand (Neitlich and McCune 1996). This structural diversity would provide potential for macrolichen recruitment in the stands.

Alternative 3: Thinning and BEHA Treatment with a Larger Buffer for NSO

Under this alternative, in the areas left untreated, fewer acres would be thinned resulting in slow growing stagnant forest conditions as noted in Alternative 1.

3.2 KEY HABITATS

3.2.1 AFFECTED ENVIRONMENT

Down Logs:

Down logs are an essential habitat feature for many wildlife species and their prey, including several BLM Special Status Species that could occur in the project area. They often provide key breeding or refuge habitat and travel corridors. They are especially important to low mobility species with small home ranges (e.g., invertebrates, small mammals, and amphibians). Stand exam data and field review indicate a high overall amount of down logs (1206 linear feet per acre [lf/ac]) in a variety of diameters and decay classes that are well

distributed in Riparian Reserves and Matrix uplands in the project area. The highest concentrations are present in Riparian Reserves. Large, moderately decayed down logs are most important to wildlife and represent those currently available as habitat. Proposed harvest areas contain 527 lf./ac. of down logs ≥ 20 inch diameter in decay class 3-4. Amounts were similar in Sections 33 and 35 and much lower in Sec. 25.

Table 4: Coarse Woody Debris Averages for Entire Project Area

Average Down Logs: Linear Ft/Ac					Average Snags/Ac				
	Diameter Range (inches at large end)					Diameter Range (dbh - inches)			
Decay Class 1-5	**8 to 15**	**16 to 19**	**≥ 20**	***Avg Totals***	**Decay Class 1-5**	**8 to 15**	**16 to 19**	**≥ 20**	***Avg Totals***
1-2	107	15	21	**143**	**1-2**	4.9	0.1	0.1	**5.1**
3-4	205	83	527	**815**	**3-4**	0.7	0.0	0.1	**0.8**
5	50	52	145	**247**	**5**	0.0	0.0	0.0	**0.0**
Avg Totals	**362**	**150**	**693**	**1205**	***Avg Totals***	**5.6**	**0.1**	**0.2**	**5.9**

Decay Classes: 1=hardest, 5=softest

Shaded cells are typical coarse wood types preferred or required by most wildlife species

Snags:

Snags are an essential habitat feature for snag dependent species and their prey. They are especially important to primary and secondary cavity nesting birds (songbirds, woodpeckers, owls) and roosting bats. Stand exam data show an average of 6 snags per acre in the project area. However, almost all of these snags are in small diameter classes (8-15 inches) which, due to their small size decay quickly and are not useable for many key wildlife life history needs. Large moderately decayed snags are most important to wildlife. Stand exam data show less than 1 snag per acre at least 16 inches diameter in decay class 3-4 in Sec. 35 and none in Sections 25 and 33.

Small Wetlands:

Several small stand alone or in/near-stream ponds (small wetlands) less than and greater than one acre exist within or near the project area. A few of these are minimally suitable breeding and rearing areas for red legged frogs.

3.2.2 ENVIRONMENTAL CONSEQUENCES

Alternative 1: No Action

Coarse Woody Debris:

Under this alternative, existing coarse woody debris habitat would not be physically degraded or removed and would not experience changes in its quality or function due to changes in surrounding microhabitats.

Small Wetlands:

There would be no physical effects to aquatic or terrestrial resources due to no action. However, some of these features would not receive some of the benefits of nearby thinning described under action alternatives.

Alternative 2: Thinning and BEHA Treatment with a Required Minimum Buffer for NSO

Coarse Woody Debris:

Project design features would physically retain most existing coarse woody debris in thinning areas. However, some snags and down logs could be damaged (particularly those in decay class 4-5), felled for safety reasons, or inadvertently knocked over during harvest. Depending on localized conditions within thinning areas, direct impacts to coarse wood and overall stand conditions due to changes in surrounding microclimates could adversely affect their function and quality as habitat until stand canopy conditions recover in 10-20 years.

Small Wetlands:
Standard RMP buffers and project specific design features would be adequate to maintain water quality for breeding and terrestrial habitat for movement to and from these wetland features. Wetlands that may be suitable for red legged frogs or northwestern salamanders could benefit from thinning to provide a slight increase in sunlight during winter months when eggs are developing.

Alternative 3: Thinning and BEHA Treatment with a Larger Buffer for NSO
Coarse Woody Debris:
The types of effects to coarse woody debris would the same as Alternative 2. However the amount would be less due to fewer acres being treated by thinning.

Small Wetlands:
The types and amounts of effects would be similar to Alternative 2.

3.3 SPECIAL STATUS SPECIES (non-T&E BLM Sensitive or Assessment)

3.3.1 AFFECTED ENVIRONMENT

BLM Special Status Sensitive and Assessment Species are analyzed because their habitats are present and they could reasonably be expected to occur in the project. Pre-project surveys are not required for these species and none were conducted. Existing BLM data shows no known locations of these species in or near the project area.

Bald Eagle (BLM Sensitive):
Suitable nesting habitat for bald eagles in the area is usually located within 1.5 miles of a large aquatic forage resource found in a lake, river, or major tributary. Nest trees are typically large trees with late seral characteristics such as large limbs and large crowns. Stand conditions surrounding nests can vary, but are optimal when they have mature-late seral characteristics to provide sufficient protection for nests and nearby perching and roosting areas.

There are no known nests in or near the proposed harvest units. Except for a few individual trees and small patches less than one acre in Sections 25 and 35, no nesting habitat exists within proposed harvest areas. Approximately 250-350 acres of suitable nesting habitat exist adjacent to or near proposed harvest areas in all three sections of the project area.

It is reasonably foreseeable that nesting could occur in the project area due to suitable nesting habitat in and near proposed harvest areas within 1.5 miles of the McKenzie River, and eagles have been observed at all times of the year along the McKenzie River. Nests are subject to disruption from noise and line-of-sight actions associated with timber harvest (0.25 mile noise, 0.5 mile line-of-sight) from January-August.

Northern Goshawk (BLM Sensitive):
This bird prefers to nest in mature to late seral age stands with late-seral characteristics. Most nests located on the Eugene District have been in mid-seral stands as young as 50 years old that have only some of the optimal stand characteristics; however, the local importance of such stands, including their likelihood of facilitating successful reproduction, is unknown. Goshawks forage in nesting habitat as well as younger stands with ample flying room and low brush.

Approximately 2/3 of proposed harvest units are low-quality suitable nesting habitat. The quality is low due to smaller tree sizes and high stem densities (restricted flying room) and regular high amounts of brush. A few individual trees or small patches less than one acre are of higher quality for nesting due to their size and age (over 80 years old). Approximately 350 acres of higher quality suitable nesting habitat in stands over 80 years old exist adjacent to proposed harvest areas in all three sections of the project area.

Fringed Myotis Bat (BLM Sensitive):
This bat roosts in a variety of substrates in coniferous forests, including rock crevices, snags, tall stumps, and the bark or crevices of large live trees. Roosting behavior occurs in different substrates at different times of year and consists of maternity areas, winter hibernacula, and daily rest. Within proposed harvest areas there are no suitable rock crevice habitats and the small amount of potential habitat is limited to larger stumps, occasional large or remnant trees, and the very low amount of snags (0.1/acre).

Harlequin Duck (BLM Assessment-Candidate for Bureau Sensitive):
Out of the 18 miles of project area streams, approximately 2.0 miles of terrestrial nesting habitat exists near Johnson Creek and part of Cogswell Creek based on key indicators such as: 3rd to 5th order size, low to moderate gradients with some down logs, boulders, forested near-stream nesting habitat, and lack of excessive human disturbance. Harlequins nest up to 150' away from a stream, although average distances are probably much less. Individuals can be very intolerant of noise or visual disturbance to nesting from April-mid July.

Cascade Torrent Salamander (BLM Assessment):
This salamander prefers springs, seeps, and cold, small, moderate to high gradient headwater streams with pebble to cobble size substrates, and low amounts of silt and embedded fines. Overall, about two thirds of project area streams are not habitat due to combinations of: south aspects, low gradients, high amounts of silt and other unsuitable substrates. Based on field review, approximately one third of project area seeps and streams (6 of 18 miles) are habitat for the species. Of the stream miles that are habitat, an estimated 25% are low quality, and 75% moderate quality. Occasionally, individuals also use terrestrial areas near streams, especially above headwalls, for some parts of their life history. Project area stream headwall areas have been impacted by clear cut harvest on adjacent private lands.

Oregon Slender Salamander (BLM Sensitive):
Key habitat indicators for this species are moist, cool, high canopy cover, coniferous forests with large well-decayed (≥ 20 inch diameter, decay class 3-5) down logs and stumps, bark piles at the base of snags, and uncompacted soil. Snag data show adequate amounts of suitable down log habitat for the species within proposed harvest areas. The best habitat is probably present within Riparian Reserves, north aspects, and moist portions of uplands. Habitat quality is reduced in much of the uplands due to southern exposures and corresponding warmer and drier microclimates. This salamander has a small home range, low mobility, and is generally intolerant of habitat changes.

Pristolama Arcticum (BLM Sensitive and former Survey and Manage):
This snail prefers moist terrestrial conditions, especially near streams and wetlands. Parts of the proposed harvest areas in Sections 25 and 33 are potential habitat within the range and elevation requiring survey and management for the species.

3.3.2 ENVIRONMENTAL CONSEQUENCES

Alternative 1: No Action

Bald Eagle:
BEHA and matrix stands would not receive the benefits of harvest treatments and therefore suitable nesting habitat at the stand level would develop at a slower rate and with less favorable structure in individual trees, especially in stands with higher tree densities that were not previously thinned.

Other Special Status Species:
No short term adverse affects to individuals, reproduction, or their habitats would occur. Benefits from accelerated tree growth and recruitment of larger down wood would occur at a slower rate compared to the action alternatives. However, stands not previously thinned would recruit greater amounts of smaller diameter coarse wood due to density induced mortality (i.e. stem exclusion).

ALTERNATIVE 2: Thinning and BEHA Treatment with a Required Minimum Buffer for NSO

Bald Eagle:

The small amount of suitable nesting trees within harvest units would be retained under all action alternatives. At the stand level, commercial thinning would accelerate the development of late-seral characteristics (e.g. large trees). For individual "target trees," treatment would increase the rate and potential that these would become suitable nest trees due to accelerated growth and improvements to tree architecture (e.g., large side limbs and crowns).

Suitable nest trees/stands in and near the project area would be surveyed to ensure nesting activity would not be precluded or disturbed by visual or line-of-sight noise associated with project actions. As a result, no adverse direct, indirect, or cumulative effects are expected to bald eagles behavior or habitat.

Programmatic ESA consultation with USFWS determined the proposed actions would have **"no effect"** on bald eagles

Northern Goshawk:

A reduction in canopy closure would degrade about 75% of the low quality nesting habitat for goshawks. Retained trees would remain structurally suitable for nesting and could be used for nesting as soon as surrounding stand conditions sufficiently recover in 5-20 years post harvest (depending on the amount of brush and rate of canopy closure). However, thinning would improve the quality of nesting and foraging habitat due to removing densely stocked understory trees and accelerating growth of dominant trees. Project actions would have the potential to preclude or disturb nesting behavior in or near harvest areas when harvest occurs during the nesting season, although seasonal restrictions for spotted owls would eliminate or reduce this potential in most of the project area.

Fringed Myotis Bat:

In the short term, retention of the existing snags and dominant live trees would reserve project area habitat for *fringed myotis* in areas subject to thinning harvest. However, direct impacts to roosting in these habitats due to changes in surrounding microclimate conditions could adversely affect their quality. However, some impacts to snags and larger live trees may be beneficial (e.g., those that become favorably warmer due to increased solar exposure). Project actions could disturb winter hibernacula or maternity roosts from September through May and daily roosting from spring through fall.

Harlequin Duck:

Suitable nesting streams would have a 200 foot or greater no-harvest buffer which would result in no effect to aquatic or terrestrial habitat where harlequins would likely nest. Noise or line-of-sight disturbance to nesting (March-July) is possible but unlikely due to the low amount of habitat in the project area, no-harvest buffer widths, and seasonal restrictions for spotted owls.

Cascade Torrent Salamander:

No-harvest buffers of 75-200 feet would maintain water quality and all stream habitats for the species. Until canopy conditions recover in 10-15 years, headwall terrestrial habitats could experience localized impacts due to changes in canopy and microclimate.

Oregon Slender Salamander:

In the short term, retention of existing downed logs and snags would reserve most habitats for the species. However, depending on localized conditions, direct impacts to coarse wood and overall stand conditions due to changes in surrounding microclimates could adversely affect their function and quality as habitat. Individuals could be displaced, and local numbers reduced, during the first 10-20 years after harvest.

Pristoloma Arcticum Snail:
Under all action alternatives, thinning would not occur closer than 75 feet from expected habitat near aquatic features. This would adequately manage species habitat and individuals if they are present.

Cumulative Effects for Non-T&E Special Status Species:
Reasonably foreseeable actions that could occur on BLM lands in the watershed would be thinning or regeneration harvest of similar habitats and result in similar or greater effects to non-T & E special status species at the project level. For these species, cumulative landscape level effects are not adequately known due to lack of specific information on individuals or local habitats (e.g., coarse wood, headwater streams, occurrence of roosts or nests) Overall, non-federal lands in the watershed contribute some short-term lower quality habitat for some of these species but little high quality or ongoing habitat for these or other non-T&E special status species. Habitats are generally not expected to improve at all time scales on non-federal lands due to typical management actions.

ALTERNATIVE 3: Thinning and BEHA Treatment with a Larger Buffer for NSO
Bald Eagle:
All NEPA and ESA effects to eagles would be the same as described under Alternative 2.

Other Special Status Species:
All effects to these species would be very similar to those described under Alternative 2. The only difference would be that roughly 100 less acres would be treated by commercial thinning.

Cumulative Effects for Non-T&E Special Status Species:
Effects would be similar to those stated in Alternative 2.

3.4 Northern Spotted Owl

Issue: *What would be the disturbance and habitat modification effects to Northern Spotted Owl (Federally Threatened) habitat in general, and successful reproduction at the nearby site specifically, due to project actions?*

3.4.1 AFFECTED ENVIRONMENT

All Habitat:
Suitable nesting habitat for spotted owls in the area is generally conifer forests greater than 80 years old with mature to late-seral characteristics such as a dense, multi-story canopy, large down logs and snags, and a somewhat open understory. Except for a very few individual trees and small patches less than one acre, no nesting habitat exists within proposed harvest areas. Roughly 350 acres of suitable nesting habitat does exist adjacent to or near proposed harvest areas in all three sections of the project area.

Dispersal habitat in the area is generally 40-80 year old stands with at least 40% canopy cover. These stands mostly provide for landscape and within-site movement and roosting with small amounts of forage opportunities. Dispersal habitat with some snags or down logs, relatively low brush, less dense stocking, an overall more complex stand structure, and ample room to freely move through the mid-understory canopies, also functions as true foraging habitat. All proposed harvest areas are dispersal habitat. Due to some pockets of high stem density and regular high amounts of brush, more than half of potential harvest areas are low quality forage habitat.

Critical Habitat:
The project area is not within a designated Critical Habitat Unit.

Surveys and Nearby Site History:
The Johnson Creek site is within the project area. It was located in 1990 and surveyed at least 3 times each year except 1998 (no surveys) and 2004 (one survey visit). A pair was present from 1990-1997 and 2006-2007 and there were no detections from 1998-2005. Pairs

attempted to nest in 1990, 1992, 1996, and 2007. The 1990 & 1992 nest trees on private land were clear cut harvested in approximately 1996. Other nest trees remain standing on BLM land. There is sufficient nesting and dispersal/forage habitat in project area sections, outside of proposed harvest areas and the Johnson Creek pair use area, to support use by another pair. This area has not been surveyed in the past.

Site-Specific Provincial Home Range Habitat:
The USFWS established provincial home ranges (PHRs) of 1.2 mile radius circles (2895 ac.) around spotted owl sites in the Cascade Ranges as a consistent area to measure the habitat condition of a site and consult on proposed actions that could affect habitat or reproduction. Based on the orientation of federal habitat, forest capable land, and known use areas, the shape (but not the total acres) of a PHR are sometimes modified for analysis of reproduction capability. A modified Johnson Creek site PHR is analyzed in this EA to reflect stands most likely used by the resident pair. Table 5 depicts the current and post-harvest conditions of PHR habitat for each action alternative.

When PHRs contain less than 40% nesting habitat, they are considered "at risk" for successful reproduction. In some situations, younger forage habitat mitigates some of the effects of low amounts of nesting habitat sufficient to still allow resident pairs to successfully reproduce. There are no established standards for determining the likelihood of nesting or occupancy when PHR nesting habitat is less than 40%. When available, survey data and nesting history often provide the best assessment of potential site occupation or reproduction.

Table 5
Existing and Post-Harvest Condition of
Johnson Creek NSO Site Provincial Home Range (PHR) Habitat

	PHR Habitat Acres (Percent of 2895 ac. PHR)			PHR Habitat Acres Degraded by Thinning
Alternative	**Dispersal &/or Forage**	**Nesting**	**Total Habitat**	**Dispersal &/or Forage**
Alt.1 – No Action (Current Condition)	1058 (37 %)	140 (5 %)	1198 (42 %)	none
Alt. 2 – Lesser NSO Buffer (Post-Harvest Condition)	468 (16 %)	140 (5 %)	608 (21 %)	590
Alt. 3 – Greater NSO Buffer (Post-Harvest Condition)	569 (20 %)	140 (5 %)	709 (25 %)	489

3.4.2 ENVIRONMENTAL CONSEQUENCES

Alternative 1: No Action

Northern spotted owl habitat would not be modified by this alternative and the Johnson Creek site would not experience short or long term adverse effects to successful occupation or reproduction. Attainment of suitable nesting characteristics in thinned sections would occur at a slower rate compared to the action alternatives.

Alternative 2: Thinning and BEHA Treatment with Required Minimum Buffer for NSO.

All Habitat:
Direct and Short Term Effects:
No nesting habitat would be removed. Scattered suitable nest trees within harvest areas probably would not be usable for nesting until surrounding canopy conditions recover in 10-15 years. Seasonal operating restrictions during the entire nesting period of March 1 to September 30 in Sections 33 & 35 would ensure nesting at the Johnson Creek site is not precluded or disturbed by noise and other project actions. Restrictions during the critical part

of the nesting season of March 1 to July 15 in Sec. 25 would mitigate most potential noise disturbance for suitable habitat that could be used by another pair.

Roughly 590 acres (340 Matrix, 250 Riparian Reserve) of dispersal/foraging habitat would be degraded to lower quality dispersal habitat with minimal forage characteristics due to removal of some codominant trees, reduction in canopy cover from 80-95% to 50-70%, and a potential increase in brush. Stand conditions outside of target tree areas would begin to recover in 10-15 years as canopy closure increases.

Indirect and Long Term Effects:
Thinning in Matrix and Riparian Reserves would improve flying room, and accelerate tree growth and the subsequent rate these stands become nesting habitat compared to the No Action Alternative. The future availability of Matrix uplands for nesting is uncertain since these lands are subject to regeneration harvest at 80 years of age.

Site-Specific Provincial Home Range (PHR) Habitat:
Known nest trees would be buffered by at least 200 meters (no harvest) under all action alternatives. Thinning of 590 acres of dispersal/forage habitat within the Johnson Creek site PHR would degrade about 50% of the existing PHR dispersal/forage habitat at least until thinned stands begin to recover in 10-15 years. About half of these acres are close to and contiguous with core activity and nest areas and therefore most likely to be important for successful reproduction at the site. Based on the amount of habitat that would be degraded by thinning, its proximity to nest trees, its role in supporting foraging and successful reproduction, and the current low amount of nesting PHR habitat, harvest actions would likely adversely affect occupation or successful reproduction at least until habitat begins to recover in 10-20 years.

Cumulative Effects:
Reasonably foreseeable actions that could occur on BLM lands in the watershed would likely be thinning or regeneration harvest of similar habitats resulting in similar or greater effects to general or PHR habitat at the site, project, and landscape levels. Any corresponding effects to individual sites are not known at this time. Non-federal lands in the watershed currently provide some dispersal habitat and negligible amounts of nesting habitat. It is likely that these private lands would continue to be harvested prior to becoming suitable nesting habitat.

Programmatic ESA consultation with USFWS determined this alternative **"is likely to adversely affect"** spotted owls due to reductions in PHR habitat that affect reproduction.

Alternative 3: Thinning and BEHA Treatment with a Larger Buffer for NSO
All Habitat:
Direct and Indirect Effects would be the same as described for Alternative 2 except that roughly 490 acres of dispersal/forage habitat would be degraded (vs. 590 ac. in Alt. 2).

Site-Specific Provincial Home Range (PHR) Habitat:
Compared to Alternative 2, this alternative would increase the chances of successful reproduction at the Johnson Creek site until thinned stands recover because 100 less acres of PHR habitat would be degraded by harvest actions, thereby providing 20% more post-harvest PHR habitat versus Alternative 2. These additional acres would facilitate successful reproduction because they are contiguous with core activity and nest tree locations, and would provide no-harvest buffering of a known nest tree and potential future nest locations.

Cumulative Effects would be the same as Alternative 2:
Programmatic ESA consultation with USFWS determined this alternative **"is likely to adversely affect"** spotted owls due to reductions in PHR habitat that affect reproduction. However, the chance of adverse affects is less than with Alternative 2.

3.5 Fisheries and Hydrology

3.5.1 AFFECTED ENVIRONMENT

Fisheries

The project area lies within three 7th field watersheds in the Lower McKenzie River 5th field watershed. These are Johnson Creek, Cogswell Creek, and Hatchery Creek. A small portion of project area in Section 25 lies in the headwaters of Montgomery Creek.

Johnson Creek Section 33:

Johnson Creek is a large 7th field watershed with a drainage area of approximately 14.5 km^2. The main channel and a headwater tributary have been highly impacted by a past debris torrent. In 1986, a slide began as a slope failure on the south face of Mount Nebo, traveled down a steep headwater tributary and into the main channel where it ran over three miles down the length of Johnson Creek to the Leaburg Canal. Silt and woody debris borne by a large volume of water flowed down the headwater tributary and most of the mainstem channel, scouring it down to bedrock. Stream adjacent riparian vegetation was also scoured away, and the canyon bottom was left a flat of large rock, gravel, and sand. The stream channel lost most of its large woody debris (LWD) structure and its habitat complexity. Fish in the mainstem of Johnson Creek were essentially eliminated by the slide.

Currently, the stream and riparian zone are in a state of recovery with a high density of streamside vegetation, stabilized banks, and a dense overstory of young red alder. A 2001 ODFW habitat survey documented low amounts of LWD and potential natural barriers which are most likely a result of the debris flow. In a post-debris flow survey (1987-1988), the BLM documented rainbow trout in the lower Johnson Creek, and recruitment of cutthroat trout in the mid and upper portion of the drainage.

Within the project area (Section 33) similar conditions exist along the mainstem channel and adjacent riparian area. Stream habitat is predominately cascades and rapids. Pools tend to be shallow and lack complexity. Key pieces of large wood are very low. Boulder, cobble, and bedrock are the dominant substrate type, with limited amounts of spawning gravel. The riparian area is well vegetated and stable with young red alder dominating the streamside overstory. Tributaries within the project area were unaffected by the 1986 debris torrent. Streambanks are well vegetated, providing adequate streamside shade, bank stability, and large wood recruitment. Key pieces of instream large wood are abundant. Channel complexity appears to be high.

Resident cutthroat trout were found throughout the mainstem in Section 33. A ten foot waterfall located approximately 2,000 feet into Section 28 is a barrier for the upstream migration of fish and is considered the end fish use. Cutthroat trout were also found in the larger tributaries (Stream 3 and approximately 2,200 feet of Stream 8). There are no anadromous or ESA listed fish species in the Johnson Creek watershed.

Cogswell Creek Section 35:

Cogswell is also a large 7th field watershed which flows into the Leaburg Canal, about two miles from the Leaburg Dam. Past and current BLM surveys have noted that the mainstem appears to have a history of erosion and channel instability. There is very little large woody debris and limited habitat complexity. The channel is predominately riffle-rapid habitat. The channel is shallow, with little deeper water or off-channel habitat. Most pools are associated with boulders or bedrock. Tributaries within the project area are stable with moderate to high quantities of LWD. The riparian area is dominated by young red alder, with minor amounts to bigleaf maple and Douglas-fir. As a result of the lack of instream structure (LWD), cover, and pool habitat, Cogswell Creek has limited capability for rearing fish.

A cascade about one mile above the mouth is at least a low-water barrier to upstream migrations to fish, as are some roads crossings in the watershed. However, cutthroat trout can be found throughout the watershed, with rainbow trout occupying the lower portion of the

system. There are no anadromous or ESA-listed fish species in the Cogswell Creek watershed.

Within Section 35, cutthroat trout were documented in the mainstem only. All other tributaries are considered nonfish-bearing due to steep channel gradient and/or high step features. Similar channel and riparian conditions exist within the project area as described above.

Hatchery Creek Section 25:
Hatchery Creek is a small watershed that drains into Leaburg Lake, approximately 0.25 mile upstream of the Leaburg Dam. BLM lands lie in the headwaters of Hatchery Creek where channel gradients are steep. Two bedrock waterfalls in Sec. 30 restrict the upstream migration of fish into and near the project area (Sec. 25). Pools are limited and tend to be plunge and trench pools associated with bedrock and large boulders. The riparian area within the project area is well vegetated and stable. The overstory vegetation is predominately older, mature conifer trees. LWD within the stream channel is moderate to high. Fish species in lower Hatchery Creek include cutthroat and rainbow trout and other non-salmonid species such as sculpin, redside shiners, dace, and lamprey. Juvenile spring chinook, which is a listed fish species under the ESA, may rear in the lower portion of the stream system. Small bedrock steps or steep channel gradient changes may restrict juvenile chinook from accessing the mid and upper portion of Hatchery Creek. The closest distance from the project area to potential spring chinook rearing habitat is approximately 1.3 miles (Streamnet 2007).

Montgomery Creek:
This is very small drainage located east of Cogswell Creek in Sections 25 and 36. It flows directly into the Leaburg Canal. Channel gradients are steep with numerous step-over bedrock and boulder features. It is estimated that only the lower portion of the reach is accessible to fish. The nearest fish-bearing habitat from the project area is approximately 0.75 mile. There are no anadromous or ESA-listed fish species in the drainage.

Haul Route:
Log transport would occur mostly over gravel surfaced road controlled by BLM and private industry. There are no stream crossings where ESA listed fish occur. The 2000 road (Steel mainline) is partially located in the Holden Creek drainage which has potential rearing habitat for juvenile spring chinook (ESA listed). Stream crossings along this road range from 0.2 to 1 mile to potential chinook habitat. Throughout the project area, the majority of transport routes are located on ridgetop and midslope roads. The small amount of bottomland roads used for haul have limited connection to fish-bearing habitat.

Hydrology
Precipitation in this region is between 45 to 60 inches annually and the majority occurs in the form of rainfall between October and April. The project area ranges in elevation from about 1000 to 2300 feet, with most acres in the rain dominated precipitation zone. Areas most susceptible to rain-on-snow events are those above about 2100 feet in elevation. A portion of two units in Sec. 25, and a small acreage in Sec. 33 are within the transient snow zone (approximately 125 acres).

The McKenzie River is listed on the 2004 Department of Environmental Quality 303(d) Water Quality Limited List for elevated stream temperatures. The McKenzie River is also on the Department of Environmental Quality list of potential concern with regard to alkalinity, arsenic, chromium, copper, iron, manganese, and nickel. During the summer months of 2000 through 2002, BLM monitored summer water temperatures on Cogswell Creek, near the main stream crossing of Road No. 17-1E-1. Water temperatures met state standards (16 degrees C) during that time.

About 110 streams exist within or adjacent to the project area. Most of these are perennial and drain into tributaries of the McKenzie River. Some streams are not connected by

surface flow to the rest of the system, which is common in rotational landslide topography. Several wetlands and springs have also been identified.

Roads and skid roads from past ground-based harvesting have impacted the stream network in Section 35. Skid roads cross streams leaving log culverts and fill in at least six locations. Several streams flow along old skid roads. Certain stream crossings on roads in this project are not functioning properly due to rust, mechanical damage, being undersized, or otherwise having a risk of failure. Unauthorized OHV use in Section 35 has resulted in direct sediment delivery to streams from vehicles driving through streams. Refer to the Fisheries section for a description of the existing sediment routing on haul routes.

Stream-side slope stability:
Cogswell Creek, Wiedenbeck Creek, and Johnson Creek have all been impacted in the last 20 years by debris torrent landslides. Those landslides scoured the channels, moving down wood and creating log jams in some areas. Old landslide scarp headwalls are visible near several tributary stream initiation points. Many of these features were probably created during the storm events of 1996-1997. Stream adjacent vegetation of Cogswell and Johnson Creeks are now dominated by alder trees.

The hydrology in all these sections has been impacted by ancient rotational landslides that occurred in conjunction with earthquakes roughly a million years ago. These large bench landforms are considered to be in equilibrium now. As is typical in rotational landslide topography, stream segments sometimes end on flat topographic benches forming small wetlands commonly referred to as 'sagponds'.

3.5.2 Environmental Consequences

Alternative 1: No Action

Peak Flow:
Peak flows would be maintained on BLM lands in the watershed since no harvest or road work would occur. No short or long term impacts would be anticipated.

Stream Temperature:
No short or long term changes to stream temperature would be expected, since existing shade in the riparian areas would remain unaltered from current conditions. The timing and magnitude of stream flows would remain relatively constant since no harvesting or other surface disturbance would be implemented.

Sedimentation:
Turbidity in streams adjacent to the project area could increase because road repairs would not take place. Water quality and impacts to fish-bearing habitat would continue to be impacted by road related sedimentation under this alternative. Deteriorating undersized stream crossing culverts could plug, blocking stream flow and the resulting road failure(s) could cause channel scouring downslope from the road. Road related sedimentation could escalate for three reasons; no stream crossing culverts would be replaced, lead-off ditches or relief culverts would not be properly maintained (or new ones installed), and no additional aggregate would be placed on the local access roads or haul routes. As a result, direct sediment delivery to streams via the ditch line from those roads would continue. An unauthorized Off Highway Vehicle (OHV) trail located in Cogswell Sec. 35 would continue to impact adjacent streams with direct sediment input. Trail conditions could worsen due to lack of maintenance or closure, resulting in even more sediment delivery to the nearby streams. The opportunity to decommission roads would be postponed until a later date. Although most of those roads have no hydrologic connection, one existing road (Road 16-1E-35.2) has stream crossings. One crossing has already failed and another could fail under extreme storm conditions.

No expansion of an existing quarry would occur under this alternative. Existing conditions of the Riparian Reserve in that area would be maintained, and there would be no sedimentation from quarry operations to nearby Cogswell Creek.

Riparian Large Woody Debris:
This alternative would have no immediate affect on the level and recruitment of instream large woody debris. The recruitment of large wood to the stream channel would continue as modified by natural processes. However, due to the uniform nature of the riparian stand, the development of large trees and subsequently large woody recruitment to the stream channel would occur at a much slower rate than Alternative 2.

Cumulative Effects:
Water quality degradation and impacts to fish bearing habitat may increase as several stream crossings further deteriorate and possibly fail due to the lack of maintenance. Without additional aggregate surfacing and relief drainage, future road conditions could accelerate sediment delivery and surface runoff to streams. Road decommissioning would be postponed until a later date.

The effective shade would be maintained along streams on BLM land, but timber harvesting on private lands may be conducted using different standards, possibly reducing the effective shade zone and increasing solar radiation to streams.

Alternative 2: Thinning and BEHA Treatment with a Required Minimum Buffer for NSO
Peak Flow:
Canopy removal could result in higher soil moisture levels due to the reduction of evapotranspiration until the canopy closes in 4 to 5 years. Commercial thinning and road work are not expected to measurably impact current peak flows because most of the harvest area is in the rain dominated zone, protective no-harvest buffers would be retained adjacent to all streams, and road improvements would reduce runoff to streams.

Stream Temperature:
Treatment in the Riparian Reserve is not expected to impact water temperature thereby protecting habitat conditions for aquatic and riparian dependent species. No-harvest buffers would be left intact and would protect existing effective shade. These buffers range from 25 feet for seeps and springs, 75 feet for small 1st and 2nd order non fish-bearing streams, and 100-200 feet for fish-bearing and larger stream channels. The primary shade zone along all streams would be maintained by these no-harvest buffers. Thinning within the secondary shade zone would maintain at least fifty percent canopy closure. Although thinning in the secondary shade zone may slightly increase direct solar radiation penetrating into the primary shade zone, the primary shade zone would provide sufficient shading to maintain stream temperatures. The creation of target trees in the BEHA may open the canopy in the secondary shade zone, but these patchy openings are not expected to impact water temperature in the nearby streams. No log yarding is proposed across any stream channels; however, cable corridors may occur in riparian reserves and across some stream channels. The number and size of corridors would be minimal and are not expected to impact stream temperature.

Sedimentation:
Treated riparian reserves would have no-harvest buffers widths of 75 to 200 feet. These buffers would provide protection to over-steepened and/or unstable streambanks and headwalls, and filter out potential sediment transported from cable and ground-based yarding processes; thus, minimizing sediment-related impacts to nearby streams and fish-bearing habitat. Helicopter and cable yarding landings are generally located on ridgetop topography and outside of the stream influence zone, providing added protection to aquatic and riparian habitat features. To minimize adverse effects to stream habitat, site specific mitigation measures would be implemented for landings located in Riparian Reserves. Implementation of project design features is expected to minimize most potential impacts to streams and wetlands.

Short-term increases in sediment could be caused by removing and replacing existing culverts, adding temporary stream crossing culverts, and renovating or constructing roads.

Most of the proposed temporary road construction is not expected to result in detectable road related sedimentation due to ridgetop locations or in areas with little or no connection to the stream network. Four new temporary stream crossing culverts would be installed. Short-term sedimentation to these four streams would be expected during culvert installation. Only small amounts of fine sediment would be mobilized at culvert removal locations because the fill would be mostly river gravel and not excavated to mineral soil. Placement of river gravel at restored stream channels is expected to provide immediate protection to the channel bottom and streambanks from potential downcutting. Implementation of project design features would minimize impacts to water quality and downstream fish habitat.

Long-term decreases in sediment delivery would result from upgrading existing culverts, adding cross drains, upgrading existing roads by adding rock, and decommissioning roads. Typically, fine sediments disturbed by the equipment are flushed out by seasonal fall rains, and some erosion occurs until disturbed soils at the stream crossing inlets/outlets are stabilized by vegetation, mulch, or rip-rap. Replacement culverts sized to accommodate 100-year storm events would reduce the risk of catastrophic failure during major flood events.

Decommissioning existing or temporary roads with stream crossings would eliminate artificial barriers to sediment transport and reduce the potential for future road/culvert failures. Sediment, bedload materials, and woody debris stored above those crossings may mobilize once the culverts are removed. The natural sediment regime would be restored. Tilling (where feasible) would help restore water infiltration to the soil and reduce the potential of surface runoff reaching nearby streams. For these reasons, road decommissioning would have long-term beneficial effects to riparian areas and downstream fish habitat despite the short-term sedimentation impacts from stream crossing restoration.

Increased road use from timber hauling and related activities could result in short-term increases in sedimentation. This project allows for year-round timber transport where impacts vary by season of use. Existing haul routes are predominately gravel surfaced roads, which if used during the wet portion of the year, could produce increases in sedimentation because existing roads route sediment/flow via ditchlines to cross drains and streams. Dry season use typically results in less sediment production. A road-related sediment delivery analysis (BLM 2007) identified that most roads within the project area have a low potential for direct sediment delivery to nearby streams due to adequate relief drainage, road surfacing aggregate and minimal amount of stream crossings. Road segments with the potential for delivery would receive additional relief culverts and/or replacements and road surfacing aggregate that would further reduce any road-related sediment delivery to streams.

Implementation of project design features would greatly minimize sedimentation impacts to project area streams.

Riparian Large Woody Debris:
This alternative would treat most of the Riparian Reserves. Thinning is expected to speed the development of large-diameter trees within the riparian thus resulting in a long-term increase in large woody debris (LWD) levels in streams and riparian reserves within the project area. This future contribution of LWD would provide habitat structure for salmonids and a variety of aquatic organisms by providing refugia habitat, the formation of deep pools and back-water and off-channel aquatic habitat, and the deposition and sorting of gravels thereby providing suitable spawning habitat.

Cumulative Effects:
Implementation of Alternative 2, combined with on-going and planned road renovation on BLM and privately owned lands, would result in a long-term reduction of road-related sediment and surface water runoff delivery to streams and fish-bearing habitat. No measurable impacts to stream flow are anticipated.

Protective streamside buffers on BLM land and the utilization of standard best management practices would maintain existing sediment rates to streams. Maintaining primary shade zones along streams in this 5th field watershed would protect water temperatures on BLM land. Such standards are not consistently used on private lands and sediment and temperature increases could potentially result in the future from those operations.

Large woody debris entering the stream system would be distributed downstream over time by natural processes, providing benefits beyond the project area.

Alternative 3: Thinning and BEHA Treatment with a Larger Buffer for NSO
Effects for this alternative would be the same as in Alternative 2.

3.6 Soils

3.6.1 Affected Environment

Description of Soils:
Blachly and McCully silty clay loams are the dominant soil series on gentle and moderately steep sideslopes.These soils are deep and highly resilient, but are very susceptible to compaction due to high clay content throughout, and lack of coarse fragments. These soils are available for ground based logging systems where slopes are less than 35 percent, but will be slow to draw moisture down to acceptable range for operations, especially on flat topography and cool aspects.

Honeygrove silty clay loam occurs on broad stable ridges and saddles. Honeygrove is weak when wet, therefore extra base rock would be necessary if roads are intended for year-round use.

Cumley silty clay loam is deep and highly resilient. These soils occur in drainage areas, usually adjacent to streams and wetlands. This deep soil has a seasonal high water table from November through April. These sites are particularly susceptible to windthrow during winter storms when soils are saturated.

Peavine silty clay loam is moderately deep and highly resilient. This soil occupies sideslopes of variable steepness, between 30 and 60 percent.

The dominant soil on steeper topography is Klickitat stony loam. This soil is classified as intermediate resiliency. Brush competition is a concern on south and west aspects due to droughtiness.

Kinney soils are deep and highly resilient. Gradual slopes would be available for ground based harvest.

Current Conditions
Cogswell Creek Section 35:
Residual effects from past activities have reduced soil productivity in localized areas. Networks of excavated skid roads with some localized rock additions are evident where ground base harvest systems were utilized on moderately steep slopes. Soil productivity is impaired due to the loss of topsoil, not just compaction. Erosion is not uncommon on steeper trails and residual compaction has limited advanced regeneration within the travelways. Though difficult to quantify, six to eight acres of the proposed unit have some soil quality impairments due to severe displacement and/or compaction. This level may exceed current RMP standards for compaction and growth loss. RMP management direction for soil quality sets the threshold at 2% of any treated area to remain compacted after amelioration (pp. 37-38). Residual compaction on slow to drain soils (some with seasonal high water table) has altered infiltration and water storage patterns particularly in the wetland complex in the center of the section on both sides of Road No. 17-1E-1 and near the beginning of Road No. 16-1E-35.2.

Johnson Creek Section 33:
There are minimal impacts to soil quality and function from past planned activities beyond residual compaction associated with three existing roads.

Hatchery Creek Section 25:
Soil productivity and function are intact in this section. Topograhy is gentle on the ridges with moderately steep sideslopes. Fairly recent timber harvest was largely conducted with cable systems from a network of graveled permanent roads.

Timber Productivity Capability Classification:
Treatment is only proposed on sites with soils that are classified as having either intermediate or high soil resiliency. These soil types can sustain substantial manipulation and still maintain nutrient capital, inherent physical and chemical capabilities, hydrologic function and natural rates of erosion.

3.6.2 ENVIRONMENTAL EFFECTS

No Action
No additional soil compaction or displacement would occur beyond what currently exists since there would be no harvest or road construction. Soil productivity reductions due to the legacy compaction and loss of topsoil would persist for the long term, especially in Cogswell Creek.

Alternative 2: Thinning and BEHA Treatment with a Required Minimum Buffer for NSO
Natural rates of erosion would be maintained under the proposed action. Project design features would minimize the potential for accelerated erosion. No harvest or road building is proposed on sensitive withdrawn soils.

Cable Yarding
Approximately 528 acres, or 64% of the total project area, would be yarded with cable systems. Direct effects of cable yarding would be displacement of surface soil and organic matter, and discontinuous localized compaction within yarding corridors. These effects tend to be confined to a narrow strip less than four feet wide. Compaction would be deeper and more continuous for areas harvested in the winter when soils are wet. Compaction reduces porosity which is an essential component of site productivity. It is instrumental for water infiltration, water storage, and gas exchange. Soils with good porosity create favorable conditions for root growth, water movement, nutrient uptake by roots, and mychorrizal growth (Amaranthus and others, 1996). Design features would limit the spatial extent of these impacts and the potential for prolonged erosion. After operations, bare soil exposure, and compaction in corridors and associated landings would occupy about three percent of the cabled portions, or 16 total acres. Full vegetative recovery within corridors is expected within five years for the highly resilient soils (Blachly, McCully, Honeygrove, and Peavine series'). Vegetative cover on the coarse textured, intermediate resiliency soils, primarily Klickitat series, is expected within 10 years. The steep droughty Klickitat soils in the northeast portion of Road No. 16-1E-35 will be most prone to chronic erosion before brush recovery.

Helicopter Yarding
Approximately 198 acres, or 24% of the project area, would be yarded with helicopters. This logging system results in negligible displacement of surface soils or compaction (Long-term Productivity Studies, Siskiyou National Forest, 1997). One helicopter landing is tentatively planned on BLM land. Long-term soil productivity would be irretrievably lost on this acre.

Ground based Yarding
Ground based yarding is only planned where suitable soils occur and slopes are less than 35 percent, approximately 101 acres, or 12% of the total project area. Ground based logging systems have the potential for more compaction than cable systems because trails are wider and compaction extends deeper. Topsoil is typically bladed off or displaced, which results in long-term effects to soil productivity along trails. Studies indicate that after six trips

all types of soil are compacted to the point where function is impaired, i.e., reduction in aeration and water storage. A suite of Best Management Practices and other design features are employed to reduce the spatial extent and duration of these effects.

After harvest, about 10% of the ground based portions would be occupied by skid trails and/or landings. Some soil types in Johnson Creek Section 33 planned for ground based harvest (Honeygrove and Blachly series) may not draw down to acceptable moisture contents, resulting in deeper compaction in these areas. Planned ground based harvest systems in parts of Cogswell Creek Section 35 where persistent residual compaction of Cumley soils in association with hydric soils still exists, would further reduce long term productivity and soil function. After harvest, all skid trails used in this entry that exhibit severe compaction would be tilled. This mitigation would restore infiltration and hasten vegetative recovery. Productivity impairments would persist for multiple decades depending on the depth of excavation. Legacy skid roads and trails not used in this proposal would not be treated/tilled. The quantity of legacy compaction in Cogswell Creek would be somewhat reduced, probably to less than the 2% RMP threshold.

Road Management

Construction of approximately 4000 ft. of road would be surfaced with crushed rock and added to the District's permanent road system. Another 4000 ft. of existing road in Sec. 33 would be renovated and remain on the road system indefinitely as well. Soil productivity would be irreversibly lost on at least 2 acres of forested land. The existing road in the SW corner of Sec. 33 (Spur 33A) and decommissioned Road No. 16-1E-35.2 had excavation and some added rock prior to this proposal, therefore the soil productivity loss is not totally associated with this action.

Construction of approximately 1400 ft. of temporary native surface road and associated landings would result in the loss of topsoil and severe compaction on 1/2 to 1 acre of productive forest land. In general, temporary roads are planned on gradual grades and tillable soils. Tillage would improve infiltration and mitigate the potential for prolonged erosion. Root growth in loosened soil areas would be better distributed and more vigorous, resulting in an accelerated improvement of soil structure and recovery back to a forested condition as compared to leaving untreated compacted surfaces. However, soil function and long-term productivity would still be impaired for 75 years, or longer due, to the loss of topsoil, duff, and litter layers.

Rock removal on about one mile of existing road in Sec. 25, would improve infiltration in the short term and may hasten vegetative recovery. Rock removal necessitates deeper excavation which lengthens the timeframe when soil productivity is limited.

Alternative 3: Thinning and BEHA Treatment with a Larger Buffer for NSO

The kind and quantity of harvest effects from cable and ground based systems would be the same as for Alternative 2. The acreage operated with helicopters would be reduced by 84 acres.

In general, the roading effects to the soil resource would be comparable to those described for Alternative 2.

3.7 Fuels

3.7.1 Affected Environment

Currently the stands are best represented by Fuel Model 8 (light timber litter) and Model 5 (moderate brush) with some small isolated pockets of Fuel Model 10 (heavy timber litter and understory). Fires carried by surface fuels made up of litter and grasses characterize Fuel Model 5. Under Fuel Model 8, fires are slow burning ground fires with low flame lengths. Fuel Model 10 fires burn in surface and ground fuels with greater intensity due to higher fuel loadings. Crowning, spotting and tree torching is frequent within this fuel type.

There is no Wildland/Urban Interface present on any of the three proposed harvest areas.

3.7.2 Environmental Consequences

No Action Alternative

Under the no action alternative, the project areas would remain Fuel Model 5 or 8 in the short term if no outside disturbance occurs and eventually transition to a Fuel Model 10 as tree mortality occurs in the long term.

Alternative 2

After thinning operations the fuel bed would not be uniform or continuous slash throughout the harvest unit, resulting in a Fuel Model 11 condition. Fuel Model 11 under the site conditions of this project yields low to moderate fire behavior except under severe weather conditions. However, Model 11 fuels will behave like Model 12 fuels, if a fire occurs while the slash is in a 'red slash' condition, usually 1 and no more than 2 years after harvest. Crown spacing after all treatments will make the occurrence of a crown fire under even severe weather conditions unlikely. The residual slash will be moved and compacted by the yarding operations resulting in openings in the fuel bed, buried slash, slash concentrations and a portion of the slash will be brought to and sorted on landings as cull material. Skid trails and yarding corridors often have light fuels with large sections of bare soil creating fire breaks within the unit but also tend to have concentrations of fuel directly adjacent to them which would burn at higher intensities.

Roads within the project areas may be utilized for multiple small landings normally associated with commercial thinning operations. Fuel concentrations associated with these landings will occur adjacent to these roadways. Landing piles will vary in size depending on site-specific operational factors resulting in varying quantities of unmerchantable material reaching each landing. As the slash breaks down the live fuels will begin to dominate with the site becoming a Fuel Model 5 within 7-10 years.

Roadside piling and pile burning would reduce the roadside fuels and eliminate point sources for intense fire behavior and long range spotting that could occur within the project area in event a wildfire starts or moves into the project area. This would also increase public and firefighter safety. Slash concentrations along roads and near landings would be piled for burning during the rainy season.

Smoke emissions from pile burning would be of short duration and in compliance with ODF through daily Smoke Management Instructions. Pile burning would likely occur between November 1 and January 1, when the most favorable emission dispersion conditions are possible. Pile burning may occur over a several day period. It is not anticipated that the burning of the piles would exceed National Ambient Air Quality Standards (NAAQS) or State Implementation Plan (SIP) for air quality. Additional fuels treatment information is available in the Fuels Treatment Project Plan in the project file.

Within the helicopter logging areas, the fuels would be deeper and more uniform than sections harvested by cable or ground based equipment. This occurs because there is less movement and compaction of the slash bed when helicopter yarding is used. This would result in a fuel bed that would burn like a Fuel Model 12. However, fuel loadings would be less and should only persist for 2-3 years after which decomposition of the needles and fine fuels would cause a transition to a Fuel Model 11. As the slash breaks down the live fuels would begin to dominate the site, transitioning to a Fuel Model 5 within 7-10 years.

Alternative 3: Thinning and BEHA Treatment with a Larger Buffer for NSO

Effects would be the same as Alternative 2**.**

3.8 Unaffected Resources

The following are either not present or would not be affected by any of the alternatives: Spring chinook critical habitat, Areas of Critical Environmental Concern, prime or unique farm lands, solid or hazardous wastes, Wild and Scenic Rivers, or Wilderness.

3.9 Environmental Justice

To comply with Executive Order 12898 of February 11, 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, the Bureau of Land Management, Eugene District, will ensure that the public, including minority and low income, have adequate access to public information relating to human health or environmental planning, regulations, and enforcement as required by law. The District has not identified any environmental effects, including human health, economic and social effects of Federal actions, including effects on minority populations, low-income populations, and Native American tribes, in this analysis.

3.10 Cultural Resources

Surveys will be conducted in 2007. If sites are found the appropriate mitigations would be taken to preserve sites.

4.0 LIST OF AGENCIES AND PERSONS CONSULTED

This environmental assessment is being mailed to the following members of the public or organizations who have requested to be on the mailing list:

This EA is being mailed out to the following members of the public and organizations:

John Bianco
Oregon DEQ
Jim Goodpasture
Pam Hewitt
Charles & Reida Kimmel
Lane County Land Management
Carol Logan, Kalapooya Sacred Circle Alliance
Oregon Dept of Fish & Wildlife
Oregon Dept of Forestry
Oregon Natural Resources Council
The Pacific Rivers Council
John Poynter
Leroy Pruitt
Neal Miller
Roseburg Forest Products Co.
American Forest Resource Council
Cascadia Wildland's Project
Peter Saraceno
Sierra Club - Many Rivers Group
Swanson Group
Craig Tupper
Jan Wroncy
Kris and John Ward
Robert P Davison
Tom Stave, U of O Library
John Muir Project
James Johnston
Molly Widmer
David Simone
Bart Pratt
Rich Wright
Roger Wilson
Rudy Wiedenbeck
Pacific Northwest 4-Wheel Drive Association
Weyerhaeuser Company

A summary was sent to those receiving the “Eugene BLM Planning and Project Focus, June 2007(approximately 250 mailings; a complete listing is available at the Eugene District Office).

5.0 CONSULTATION

Upper Willamette Spring Chinook (Threatened)
ESA Affects Determination/Rationale
The action alternative would have no effect on spring Chinook salmon or designated critical habitat. Most of the project area has no direct or indirect connection to listed fish habitat, with the exception of the Hatchery Creek Unit. Streams within this project unit have connection to juvenile spring Chinook rearing habitat which is approximately 1.3 miles downstream of the project area. Proposed actions (i.e. timber harvest, road improvements and timber hauling) may result in localized and short-term effects that are not expected to extend beyond the project area.

Essential Fish Habitat
The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) requires Federal agencies to consult with the Secretary of Commerce regarding any action or proposed action authorized, funded, or undertaken by the agency that may adversely affect Essential Fish Habitat (EFH) under the Act. The action alternative, as described and analyzed in this environmental assessment (EA) would have no adverse effect on waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.

6.0 LIST OF PREPARERS

THE INTERDISCIPLINARY TEAM

Name	Title	Resource/Discipline
Mike Blow	Wildlife Biologist	Wildlife
Rudy Wiedenbeck	Soil Scientist	Soils
Fred Kallien	Fuels Specialist	Fuels
David Mattson	Engineer	Engineering
Chuck Vostal	Fisheries Biologist	Fisheries
Kris Ward	Hydrologist	Hydrology
Lori Miller	Forester	Logging Design
Jill Williams	Forester	Silviculture
Jack Zwiesler	Forester	Facilitator
Christie Hardenbrook	Environmental Specialist	Team Lead/NEPA

CITATIONS

Amaranthus, Michael P.; Page-Dumroese, Debbie; Harvey, Al; Cazares, Efren; Bednar, Larry F. 1996. Soil compaction and organicmatter removal affect conifer seedling nonmycorrhizal and ecto mycorrhizal root tip abundance and diversity. Res. Pap. PNW-RP-494. Portland, OR: U.S.

Amaranthus, Michael P.; Steinfeld, David E. 1997. Soil Compaction after yarding of small-diameter Douglas-fir with a small tractor in southwest Oregon. Res. Pap. PNW-RP-504. Portland OR: USDA, Forest Service, Pacific Northwest Research Station.

Neitlich, P. McCune, B. 1997. Hotspots of Epiphytic Lichen Diversity in two Young Managed Forests. Conservation Biology, vol. 11, February 1997.

U.S.D.I. Bureau of Land Management-Eugene District, 1999. *McKenzie Resource Area Bald Eagle Habitat Management Plan*. Eugene District BLM, Eugene, Oregon. 60 pp.

U.S. Fish and Wildlife Service, 1986. *Recovery Plan for the Pacific Bald Eagle.* U.S. Fish and Wildlife Service, Portland, Oregon. 160 pp.

APPENDIX A: MAPS